



(12) **United States Patent**
Arsenault

(10) **Patent No.:** **US 9,294,540 B2**
(45) **Date of Patent:** ***Mar. 22, 2016**

(54) **PROCESSING SELECTED BROWSER REQUESTS**

(71) Applicant: **Facebook, Inc.**, Menlo Park, CA (US)

(72) Inventor: **David Arsenault**, Reston, VA (US)

(73) Assignee: **FACEBOOK, INC.**, Menlo Park, CA (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

This patent is subject to a terminal disclaimer.

(21) Appl. No.: **13/835,015**

(22) Filed: **Mar. 15, 2013**

(65) **Prior Publication Data**
US 2013/0311541 A1 Nov. 21, 2013

Related U.S. Application Data

(63) Continuation of application No. 13/191,844, filed on Jul. 27, 2011, now Pat. No. 8,539,023, which is a continuation of application No. 12/172,703, filed on Jul. 14, 2008, now Pat. No. 7,996,460, which is a

(Continued)

(51) **Int. Cl.**
H04L 29/06 (2006.01)
H04L 29/08 (2006.01)
H04L 12/707 (2013.01)
G06F 15/16 (2006.01)

(52) **U.S. Cl.**
CPC **H04L 67/02** (2013.01); **H04L 29/06047** (2013.01); **H04L 45/22** (2013.01); **H04L 67/2814** (2013.01); **H04L 67/42** (2013.01)

(58) **Field of Classification Search**

CPC H04L 45/22; H04L 67/2814; H04L 67/02; H04L 29/06047

USPC 709/203, 218, 219, 238, 239; 370/352
See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

4,238,853 A 12/1980 Ehrsam et al.
4,578,530 A 3/1986 Zeidler

(Continued)

FOREIGN PATENT DOCUMENTS

EP 0848338 6/1998
EP 0855659 7/1998

(Continued)

OTHER PUBLICATIONS

U.S. Appl. No. 14/586,844, filed Dec. 30, 2014, Harada.

(Continued)

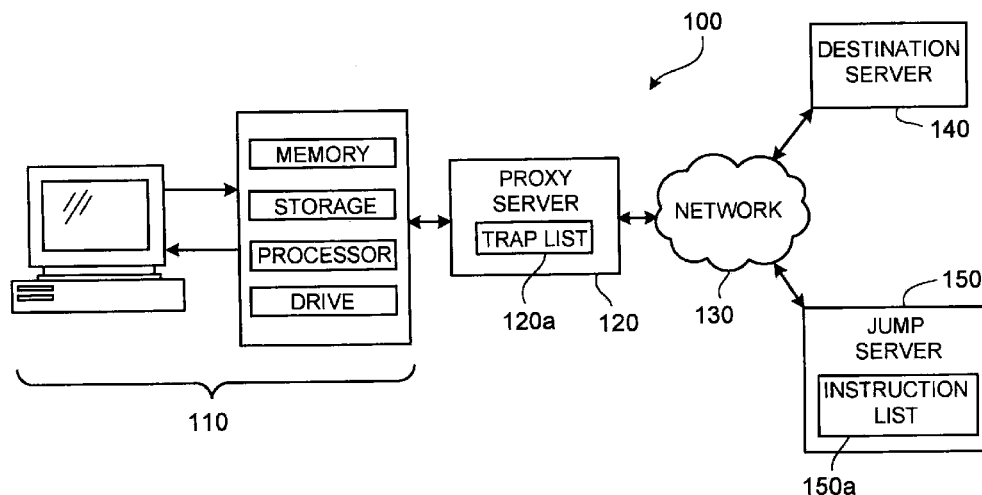
Primary Examiner — Alina N Boutah

(74) *Attorney, Agent, or Firm* — Keller Jolley Preece

(57) **ABSTRACT**

Processing a browser request that specifies a destination network resource generally includes intercepting a browser request that specifies a selected destination network resource and redirecting the browser request to a network server that differs from the destination resource specified by the browser request. Processing a browser request also may include intercepting a browser request received from a client computer at a proxy server when the browser request specifies a selected destination network resource and performing instructions associated with and in addition to instructions performed to download the selected destination network resource.

20 Claims, 11 Drawing Sheets



Related U.S. Application Data

continuation of application No. 09/693,840, filed on Oct. 23, 2000, now Pat. No. 7,401,115.

- (60) Provisional application No. 60/160,874, filed on Oct. 22, 1999.

(56) **References Cited**

U.S. PATENT DOCUMENTS

5,245,656	A	9/1993	Loeb et al.	6,212,563	B1	4/2001	Beser	
5,586,260	A	12/1996	Hu	6,212,640	B1	4/2001	Abdelnur et al.	
5,590,197	A	12/1996	Chen et al.	6,223,215	B1	4/2001	Hunt et al.	
5,671,279	A	9/1997	Elgamal	6,226,752	B1 *	5/2001	Gupta et al.	726/9
5,673,322	A	9/1997	Pepe et al.	6,243,864	B1	6/2001	Odani et al.	
5,678,041	A	10/1997	Baker et al.	6,253,202	B1	6/2001	Gilmour	
5,708,780	A *	1/1998	Levergood et al.	6,253,326	B1	6/2001	Lincke et al.	
5,740,252	A	4/1998	Minor et al.	6,272,492	B1	8/2001	Kay	
5,740,361	A	4/1998	Brown	6,272,631	B1	8/2001	Thomlinson et al.	
5,754,938	A	5/1998	Herz et al.	6,286,043	B1	9/2001	Cuomo et al.	
5,757,925	A	5/1998	Faybishenko	6,286,046	B1	9/2001	Bryant	
5,764,890	A	6/1998	Glasser et al.	6,289,462	B1	9/2001	McNabb et al.	
5,802,320	A	9/1998	Baehr et al.	6,298,380	B1	10/2001	Coile et al.	
5,805,803	A	9/1998	Birrell et al.	6,308,216	B1	10/2001	Goldschmidt et al.	
5,812,769	A	9/1998	Graber et al.	6,314,565	B1	11/2001	Kenner et al.	
5,815,665	A	9/1998	Teper et al.	6,321,336	B1	11/2001	Applegate et al.	
5,818,446	A	10/1998	Bertram et al.	6,324,585	B1	11/2001	Zhang et al.	
5,825,890	A	10/1998	Elgamal et al.	6,330,561	B1	12/2001	Cohen et al.	
5,826,025	A	10/1998	Gramlich	6,330,588	B1	12/2001	Freeman	
5,826,242	A	10/1998	Montulli	6,357,010	B1	3/2002	Viets et al.	
5,845,070	A	12/1998	Ikudome	6,360,270	B1 *	3/2002	Cherkasova et al.	709/229
5,845,300	A	12/1998	Comer et al.	6,373,950	B1	4/2002	Rowney	
5,848,396	A	12/1998	Gerace	6,385,592	B1	5/2002	Angles et al.	
5,855,008	A	12/1998	Goldhaber et al.	6,389,460	B1	5/2002	Stewart et al.	
5,889,956	A	3/1999	Hauser et al.	6,389,462	B1	5/2002	Cohen et al.	
5,892,761	A	4/1999	Stracke, Jr.	6,393,407	B1	5/2002	Middleton et al.	
5,905,872	A	5/1999	DeSimone et al.	6,415,322	B1	7/2002	Jaye	
5,908,469	A	6/1999	Botz et al.	6,418,471	B1	7/2002	Shelton et al.	
5,933,827	A	8/1999	Cole et al.	6,421,781	B1	7/2002	Fox et al.	
5,941,954	A	8/1999	Kalajan	6,434,608	B1	8/2002	Desai	
5,944,794	A	8/1999	Okamoto et al.	6,438,125	B1 *	8/2002	Brothers	370/352
5,960,411	A	9/1999	Hartman et al.	6,438,592	B1	8/2002	Killian	
5,961,593	A	10/1999	Gabber et al.	6,438,652	B1	8/2002	Jordan et al.	
5,974,398	A	10/1999	Hanson et al.	6,460,081	B1	10/2002	Doherty et al.	
5,978,799	A	11/1999	Hirsch	6,460,141	B1	10/2002	Olden	
5,987,454	A	11/1999	Hobbs	6,466,970	B1	10/2002	Lee et al.	
5,991,735	A	11/1999	Gerace	6,487,538	B1	11/2002	Gupta et al.	
5,991,795	A	11/1999	Howard et al.	6,487,592	B1	11/2002	Sawyer et al.	
5,991,810	A	11/1999	Shapiro et al.	6,490,602	B1	12/2002	Kraemer	
6,029,175	A	2/2000	Chow et al.	6,516,000	B1	2/2003	Kshirsagar et al.	
6,038,598	A	3/2000	Danneels	6,532,493	B1 *	3/2003	Aviani et al.	709/224
6,041,357	A	3/2000	Kunzelman et al.	6,564,243	B1 *	5/2003	Yedidia et al.	709/203
6,047,376	A	4/2000	Hosoe	6,571,295	B1 *	5/2003	Sidana	709/246
6,049,821	A	4/2000	Theriault et al.	6,587,836	B1	7/2003	Ahlberg et al.	
6,049,877	A	4/2000	White	6,606,643	B1	8/2003	Emens et al.	
6,052,785	A	4/2000	Lin et al.	6,606,657	B1	8/2003	Zilberstein et al.	
6,073,175	A *	6/2000	Tavs et al.	6,606,663	B1	8/2003	Liao et al.	
6,081,900	A	6/2000	Subramaniam et al.	6,606,708	B1	8/2003	Devine et al.	
6,092,053	A	7/2000	Boesch et al.	6,615,258	B1	9/2003	Barry et al.	
6,092,196	A	7/2000	Reiche	6,640,242	B1	10/2003	O'Neal et al.	
6,092,204	A *	7/2000	Baker	6,651,095	B2	11/2003	Barlock et al.	
6,105,027	A	8/2000	Schneider et al.	6,687,732	B1 *	2/2004	Bector et al.	709/200
6,112,212	A	8/2000	Heitler	6,687,746	B1	2/2004	Shuster et al.	
6,112,227	A	8/2000	Heiner	6,718,390	B1 *	4/2004	Still et al.	709/229
6,119,098	A	9/2000	Guyot et al.	6,735,631	B1	5/2004	Oehrke et al.	
6,128,627	A	10/2000	Mattis et al.	6,760,746	B1	7/2004	Schneider	
6,128,663	A	10/2000	Thomas	6,766,454	B1	7/2004	Riggins	
6,131,095	A	10/2000	Low et al.	6,769,019	B2	7/2004	Ferguson	
6,138,162	A	10/2000	Pistriotto et al.	6,775,687	B1	8/2004	Binding et al.	
6,141,010	A	10/2000	Hoyle	6,944,669	B1	9/2005	Saccocio	
6,144,996	A	11/2000	Starnes et al.	7,103,018	B1	9/2006	Hansen et al.	
6,151,686	A	11/2000	McDonough et al.	7,130,885	B2	10/2006	Chandra et al.	
6,161,145	A	12/2000	Bainbridge et al.	7,146,505	B1	12/2006	Harada et al.	
6,178,411	B1	1/2001	Reiter	7,225,249	B1	5/2007	Barry et al.	
6,178,441	B1	1/2001	Elnozahy	7,272,639	B1 *	9/2007	Levergood et al.	709/218
6,182,141	B1	1/2001	Blum et al.	7,275,086	B1	9/2007	Bodnar	
6,195,681	B1	2/2001	Appleman et al.	7,343,351	B1	3/2008	Bishop et al.	
				7,401,115	B1	7/2008	Arsenault	
				7,895,446	B2	2/2011	Harada et al.	
				7,966,259	B1	6/2011	Bui	
				7,996,460	B1	8/2011	Arsenault	
				8,539,023	B2	9/2013	Arsenault	
				8,688,777	B2	4/2014	Arsenault	
				8,688,778	B2	4/2014	Arsenault	
				8,694,581	B2	4/2014	Arsenault	
				8,713,690	B2	4/2014	Harada et al.	
				8,713,694	B2	4/2014	Harada et al.	
				8,713,695	B2	4/2014	Harada et al.	
				8,751,790	B2	6/2014	Harada et al.	

(56)

References Cited**U.S. PATENT DOCUMENTS**

9,043,892	B2	5/2015	Harada et al.
2001/0023436	A1	9/2001	Srinivasan et al.
2001/0039587	A1	11/2001	Uhler et al.
2001/0047484	A1	11/2001	Medvinsky et al.
2002/0052935	A1	5/2002	Paxhia et al.
2002/0059402	A1	5/2002	Belanger
2002/0087559	A1	7/2002	Pratt
2002/0089958	A1	7/2002	Feder et al.
2003/0009430	A1	1/2003	Burkey et al.
2003/0036974	A1	2/2003	Allen
2005/0240992	A1	10/2005	Coley et al.
2006/0047847	A1	3/2006	Saccocio
2006/0095526	A1	5/2006	Levergood et al.
2008/0201344	A1	8/2008	Levergood et al.
2013/0311542	A1	1/2013	Arsenault
2013/0179677	A1	7/2013	Harada et al.
2015/0237168	A1	8/2015	Arsenault

FOREIGN PATENT DOCUMENTS

EP	0893920	1/1999
JP	9-114783	5/1989
JP	11-31126	5/1997
WO	WO 97/15885	5/1997
WO	WO 98/31155	7/1998
WO	WO 98/33130	7/1998
WO	WO 98/36522	8/1998
WO	WO 98/43150	10/1998
WO	WO 98/45793	10/1998
WO	WO 98/58334	12/1998
WO	WO 99/00958	1/1999
WO	WO 99/00960	1/1999
WO	WO 99/03243	1/1999
WO	WO 00/79432	12/2000
WO	WO 01/43033	6/2001

OTHER PUBLICATIONS

Gabber et al., "How to Make Personalized Web Browsing Simple, Secure, and Anonymous," Financial Cryptography, International Conference, Feb. 24, 1997 (XP002059819), pp. 17-31.

Petitcolas et al., "WebGroup: a secure group access control tool for the World-Wide Web," Proceedings -the Workshop on Enabling Technologies: Infrastructure for Collaborative Enterprises, US, IEEE Computer Society Press, Los Alamitos, CA, 1998 (XP002142486), pp. 301-305.

U.S. Appl. No. 09/258,242, filed Feb. 26, 1999.

Wu et al., Virtual Proxy Servers for WWW and Intelligent Agents on the Internet, 1997 IEEE.

R. Collier, Canadian Office Action, Application No. 2,363,571, Jan. 15, 2004, 3 pages.

"Sixth International World Wide Web Conference" Conference Proceedings, <http://decweb.ethz.ch/WWW6/>.

"Extranet Security: What's Right for the Business?," Steve Trulan, p. 47, Information Systems Security, vol. 7, No. 1, Spring 1998.

"Exploiting User Behavior in Prefetching Www Documents", El Saddik et al., pp. 302-311, Interactive Distributed Multimedia Systems and Telecommunications Services, 5th International Workshop 1998.

Network News (UK Edition), pp. 29-30, Nov. 18, 1998, Issue 156.

"Intercessory Objects within Channels" Barry Kitson, Telecom Research Laboratories, 1995.

"Webgroup: a secure group access control tool for the World-Wide Web", Petitcolas and Zhang pp. 301-305, Proceedings of Seventh IEEE International Workshops on Enabling Technologies: Infrastructure for Collaborative Enterprises, 1998.

"Notice of Reasons for Rejection," Japanese Patent Application No. 2000-601562, Jul. 8, 2004.

"Statement of Grounds of Opposition," Australian Patent Application No. 200035010 (769163), Jul. 15, 2004.

Japanese Office Action issued on Nov. 29, 2005 for JP 2001-500930, 3 pages. Translation of the Japanese Office Action, 2 pages.

Kamiba et al., "User Profile Management Act", Information Processing Institute Study Report (97-HI-70), vol. 97, No. 2, Jan. 16, 1997, pp. 1-8. Partial translation of publication, 3 pages.

"Recent Application Server Situations", ASCII NT, vol. 4, No. 3, Mar. 1, 1999, pp. 225-229. Partial translation of publication, 2 pages.

International Search Report issued in WO 00/73876 on Jan. 29, 2001.

Baentsch et al., "World Wide Web Caching: The Application-Level View of the Internet," IEEE, Jun. 1997, pp. 170-178.

U.S. Appl. No. 09/258,242, Apr. 1, 2003, Office Action.

U.S. Appl. No. 09/323,415, Aug. 12, 2002, Office Action.

U.S. Appl. No. 09/323,415, Sep. 17, 2003, Office Action.

U.S. Appl. No. 09/323,415, Feb. 24, 2004, Office Action.

U.S. Appl. No. 09/323,415, Sep. 3, 2004, Office Action.

U.S. Appl. No. 09/323,415, Mar. 23, 2005, Notice of Allowance.

U.S. Appl. No. 09/323,415, Mar. 7, 2006, Notice of Allowance.

U.S. Appl. No. 09/693,840, Dec. 5, 2003, Office Action.

U.S. Appl. No. 09/693,840, May 28, 2004, Office Action.

U.S. Appl. No. 09/693,840, Mar. 11, 2008, Notice of Allowance.

U.S. Appl. No. 09/693,860, Dec. 19, 2003, Office Action.

U.S. Appl. No. 09/693,860, Jul. 1, 2004, Office Action.

U.S. Appl. No. 09/693,860, Feb. 9, 2005, Notice of Allowance.

U.S. Appl. No. 09/693,860, May 3, 2005, Notice of Allowance.

U.S. Appl. No. 11/223,121, Aug. 19, 2008, Office Action.

U.S. Appl. No. 11/223,121, Feb. 2, 2009, Office Action.

U.S. Appl. No. 11/535,056, Jun. 23, 2008, Office Action.

U.S. Appl. No. 11/535,056, Feb. 26, 2009, Office Action.

U.S. Appl. No. 11/535,056, Feb. 22, 2010, Office Action.

U.S. Appl. No. 11/535,056, Jun. 24, 2010, Office Action.

U.S. Appl. No. 11/535,056, Oct. 18, 2010, Notice of Allowance.

U.S. Appl. No. 12/172,703, Apr. 28, 2010, Office Action.

U.S. Appl. No. 12/172,703, Oct. 15, 2010, Office Action.

U.S. Appl. No. 12/172,703, Mar. 30, 2011, Notice of Allowance.

U.S. Appl. No. 13/030,986, Feb. 16, 2012, Office Action.

U.S. Appl. No. 13/030,986, Aug. 1, 2012, Office Action.

U.S. Appl. No. 13/030,986, Nov. 27, 2012, Office Action.

U.S. Appl. No. 13/030,986, Apr. 12, 2013, Office Action.

U.S. Appl. No. 13/030,986, Dec. 18, 2013, Notice of Allowance.

U.S. Appl. No. 13/191,844, Sep. 28, 2011, Office Action.

U.S. Appl. No. 13/191,844, Mar. 14, 2012, Office Action.

U.S. Appl. No. 13/191,844, Oct. 1, 2012, Notice of Allowance.

U.S. Appl. No. 13/191,844, May 24, 2013, Notice of Allowance.

U.S. Appl. No. 13/613,892, Jul. 8, 2013, Office Action.

U.S. Appl. No. 13/613,892, Dec. 10, 2013, Notice of Allowance.

U.S. Appl. No. 13/614,201, May 31, 2013, Office Action.

U.S. Appl. No. 13/614,201, Sep. 13, 2013, Notice of Allowance.

U.S. Appl. No. 13/614,201, Nov. 22, 2013, Notice of Allowance.

U.S. Appl. No. 13/614,225, Jul. 22, 2013, Office Action.

U.S. Appl. No. 13/614,225, Dec. 10, 2013, Notice of Allowance.

U.S. Appl. No. 13/616,516, Jun. 27, 2013, Office Action.

U.S. Appl. No. 13/616,516, Dec. 23, 2013, Notice of Allowance.

U.S. Appl. No. 13/616,540, Jun. 26, 2013, Office Action.

U.S. Appl. No. 13/616,540, Dec. 26, 2013, Notice of Allowance.

U.S. Appl. No. 13/616,620, Mar. 20, 2013, Office Action.

U.S. Appl. No. 13/616,620, Oct. 2, 2013, Notice of Allowance.

U.S. Appl. No. 13/616,620, Feb. 4, 2014, Notice of Allowance.

U.S. Appl. No. 13/786,212, Feb. 3, 2014, Office Action.

U.S. Appl. No. 13/836,430, Sep. 11, 2014, Notice of Allowance.

U.S. Appl. No. 13/836,430, Feb. 2, 2015, Notice of Allowance.

U.S. Appl. No. 13/836,430, Jun. 12, 2015, Notice of Allowance.

U.S. Appl. No. 13/836,430, Sep. 21, 2015, Notice of Allowance.

U.S. Appl. No. 13/786,273, Sep. 25, 2014, Office Action.

U.S. Appl. No. 13/786,273, Feb. 11, 2015, Notice of Allowance.

U.S. Appl. No. 14/586,844, May 15, 2015, Office Action.

U.S. Appl. No. 14/586,844, Sep. 1, 2015, Office Action.

U.S. Appl. No. 14/949,659, filed Nov. 23, 2015, Arsenault.

U.S. Appl. No. 14/950,895, filed Nov. 24, 2015, Arsenault.

* cited by examiner

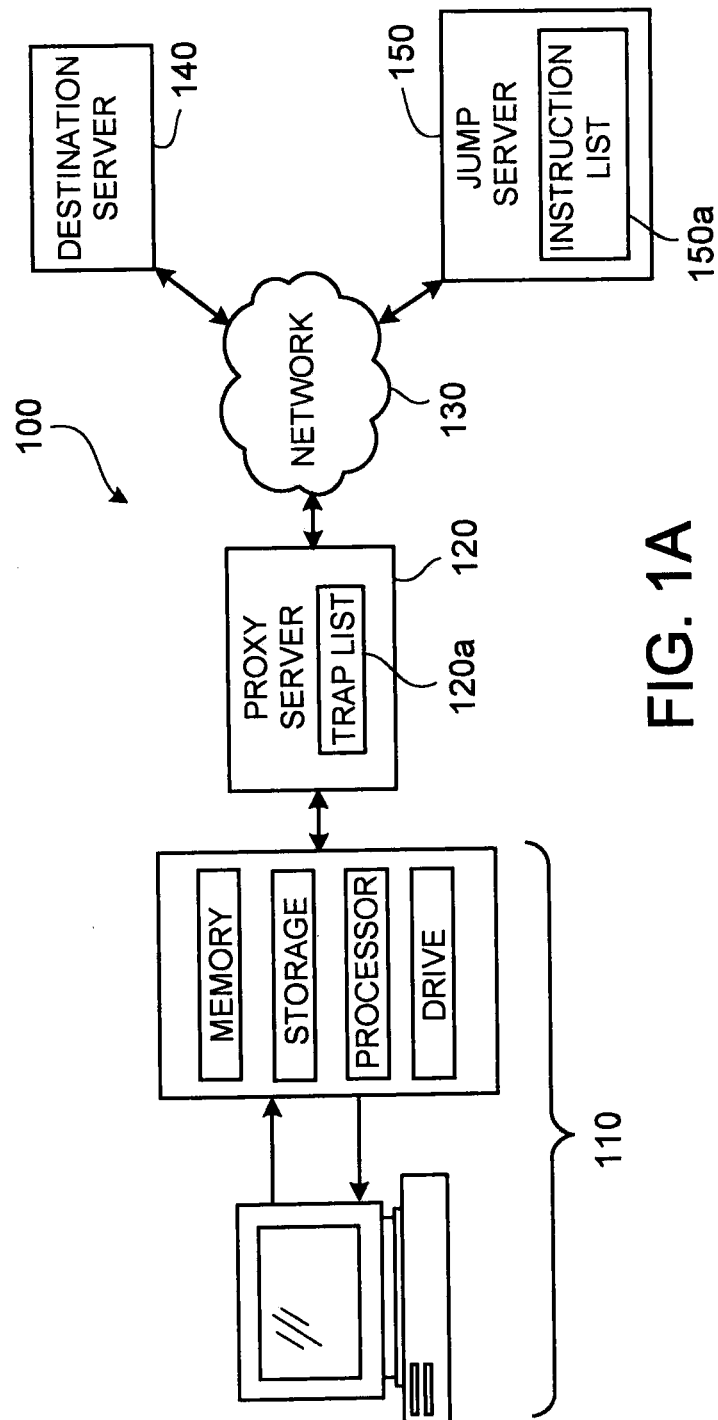


FIG. 1A

120a

**Trap List Used To Filter Browser Requests**

```
# Shopping Toolbar / Jump Server Domains
# This file tells the proxy what domains (both www.gap.com and
# gap.com formats) to “trap” and send to the Jump (toolbar) Servers.

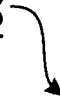
www.1800flowers.com URL  0x0 0
/ 0x00011000 0x0

1800flowers.com URL  0x0 0
/ 0x00011000 0x0

www.800.com URL  0x0 0
/ 0x00011000 0x0
```

FIG. 1B

150a



Instruction List Associating Filtered Domains With Desired Content or Processing

```

ns_jump_add url http://sportsmansguide.com/ {URL http://sportsmansguide.com/} {{ADP file} frameset.adp} {{Real URL}
http://sportsmansguide.com/?} {Enabled t} {title "Sportman's Guide"}}

ns_jump_add url http://www.sportsmansguide.com/ {URL http://www.sportsmansguide.com/} {{ADP file} frameset.adp} {{Real
URL} http://www.sportsmansguide.com/?} {Enabled t} {title "Sportman's Guide"}}

ns_jump_add url http://storybookheirlooms.com/ {URL http://storybookheirlooms.com/} {{ADP file} frameset.adp} {{Real URL}
http://storybookheirlooms.com/?} {Enabled t} {title "Storybook Heirlooms"}}

ns_jump_add url http://www.storybookheirlooms.com/ {URL http://www.storybookheirlooms.com/} {{ADP file} frameset.adp}
{{Real URL} http://www.storybookheirlooms.com/?} {Enabled t} {title "Storybook Heirlooms"}}

ns_jump_add url http://surplusauction.com/ {URL http://surplusauction.com/} {{ADP file} frameset.adp} {{Real URL}
http://surplusauction.com/?} {Enabled t} {title "Surplus Auctions"}}

```

FIG. 1C

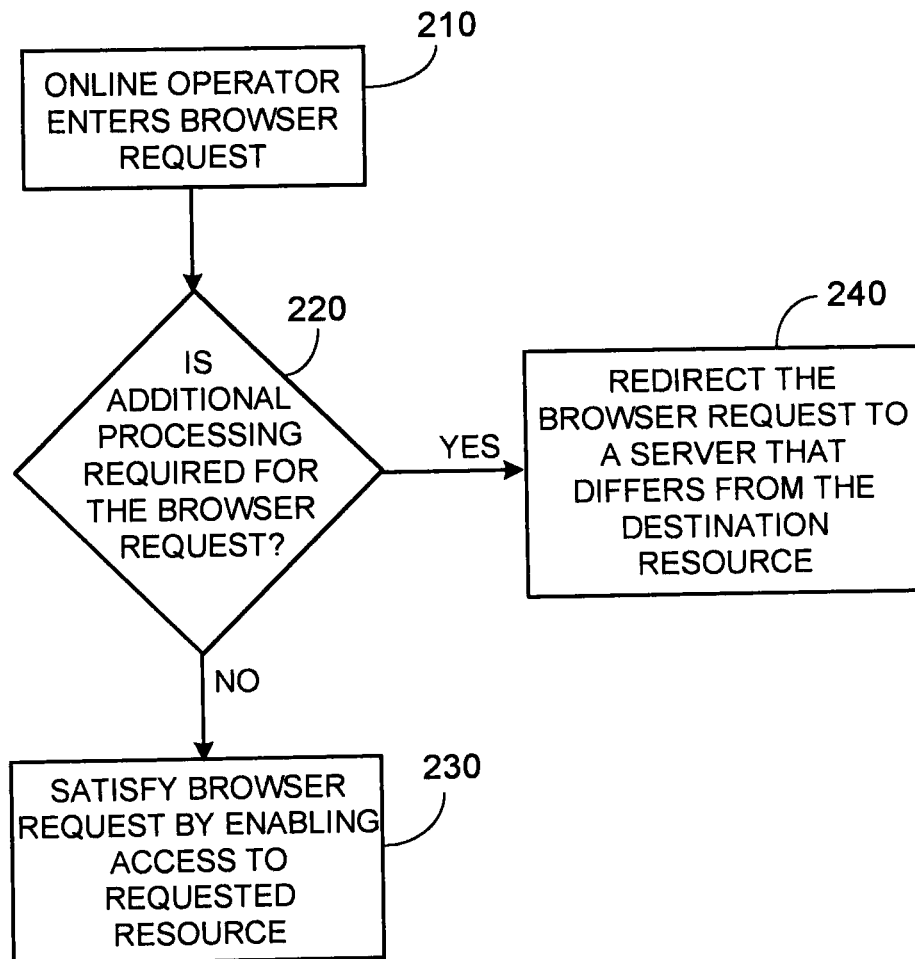


FIG. 2A

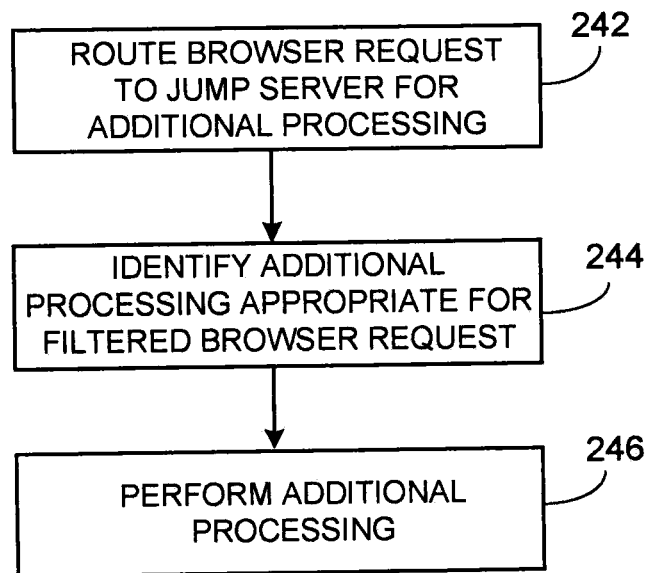


FIG. 2B

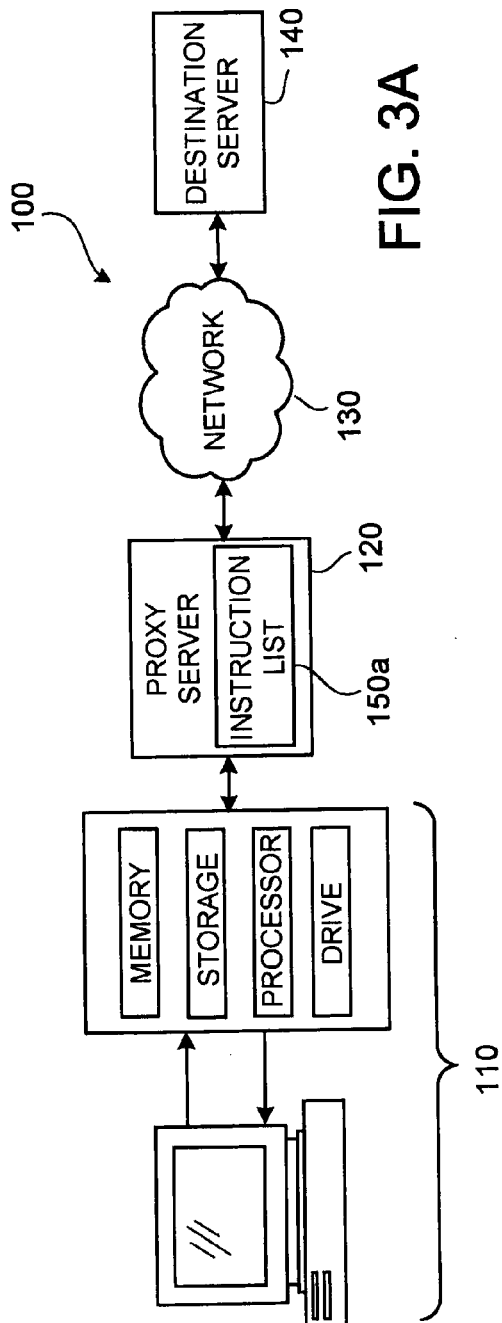


FIG. 3A

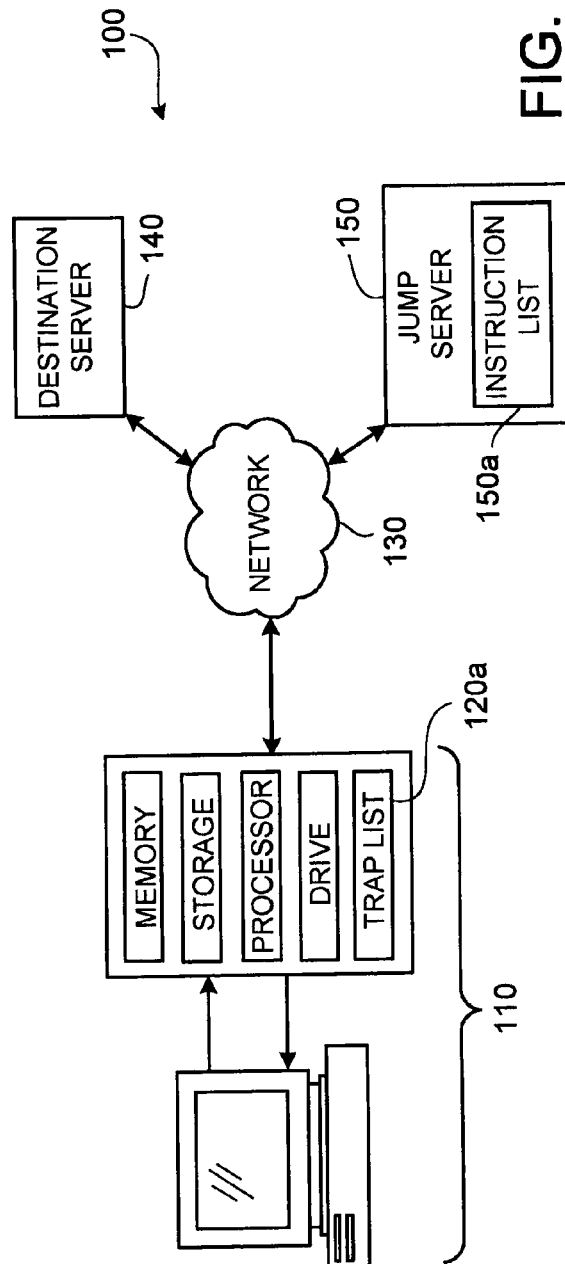


FIG. 3B

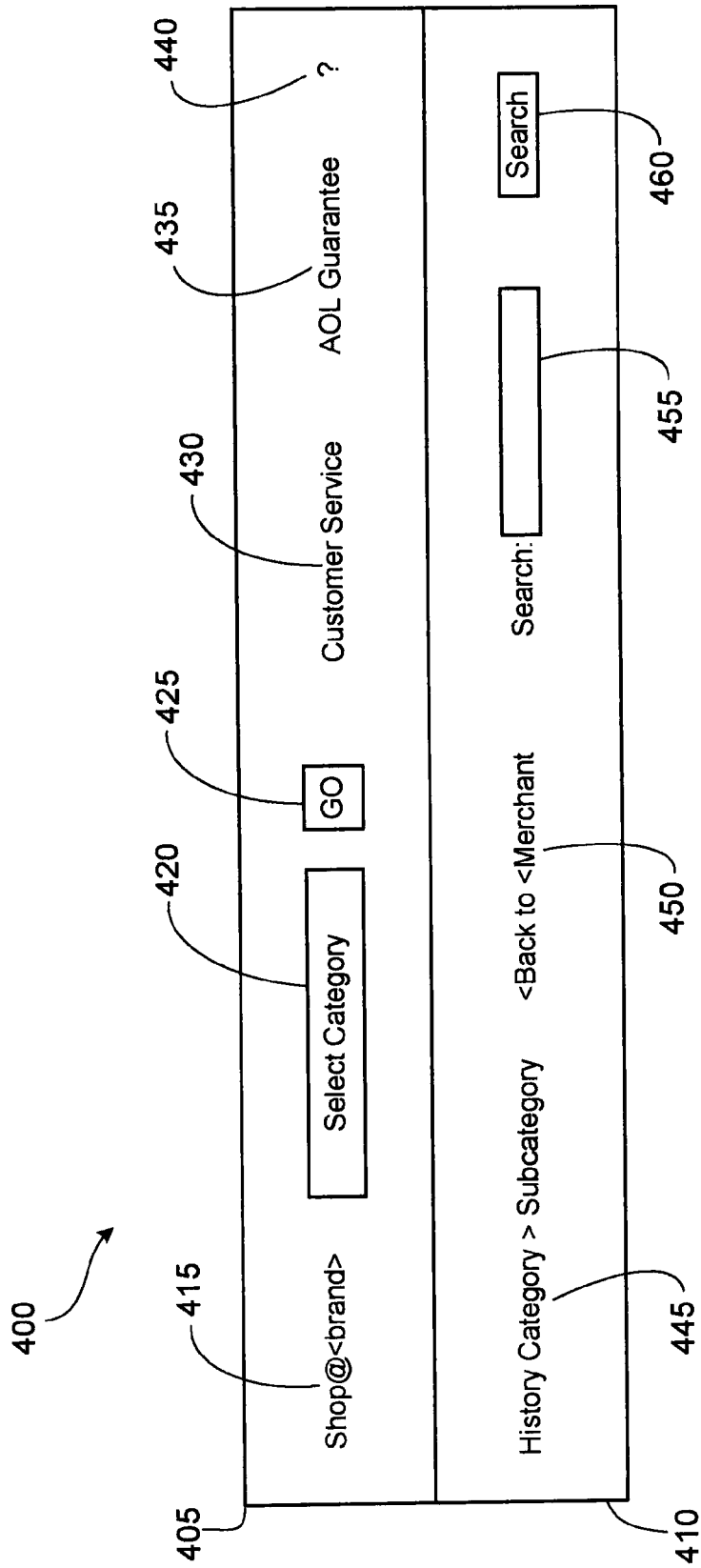


FIG. 4A

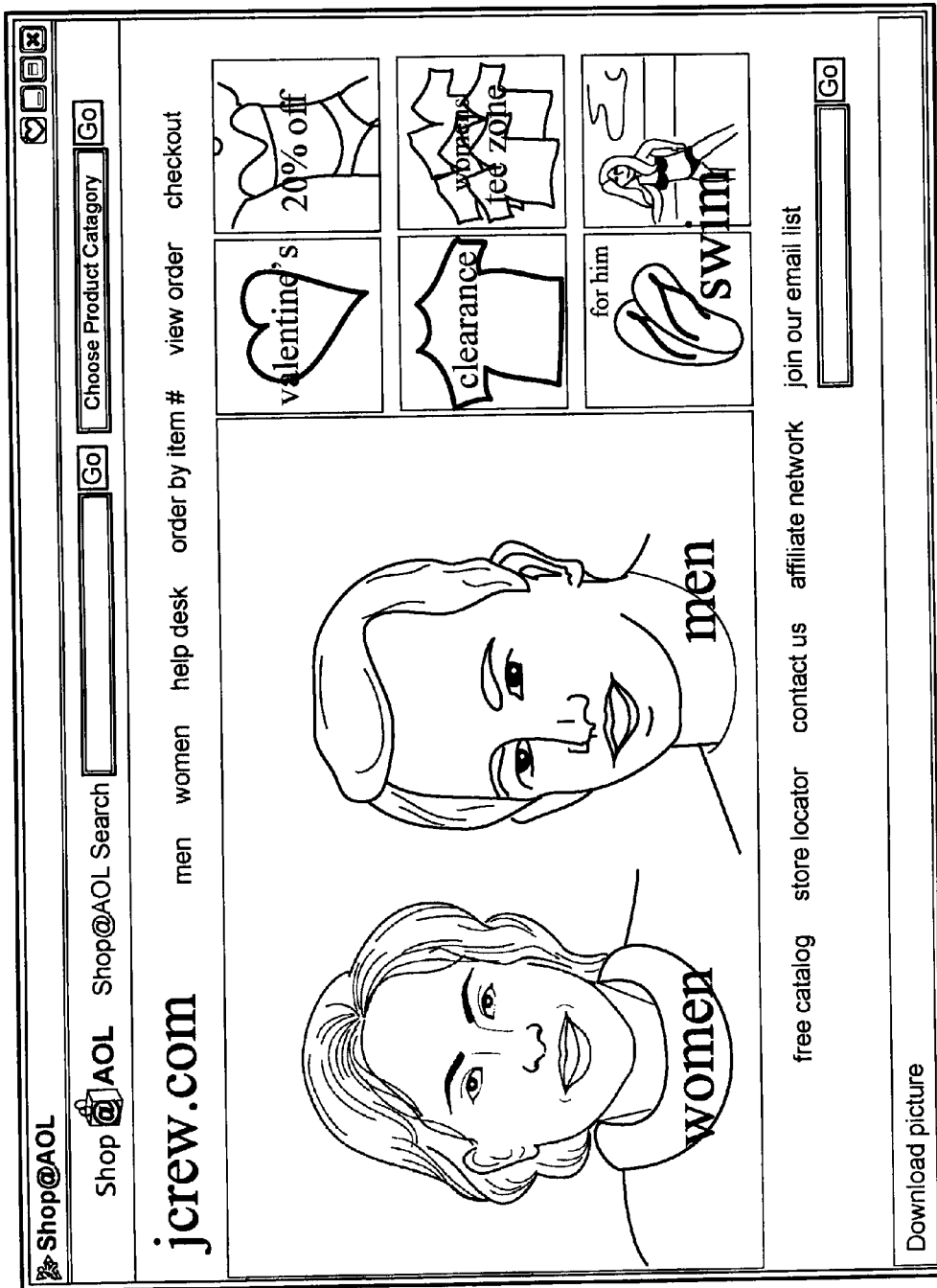


FIG. 4B

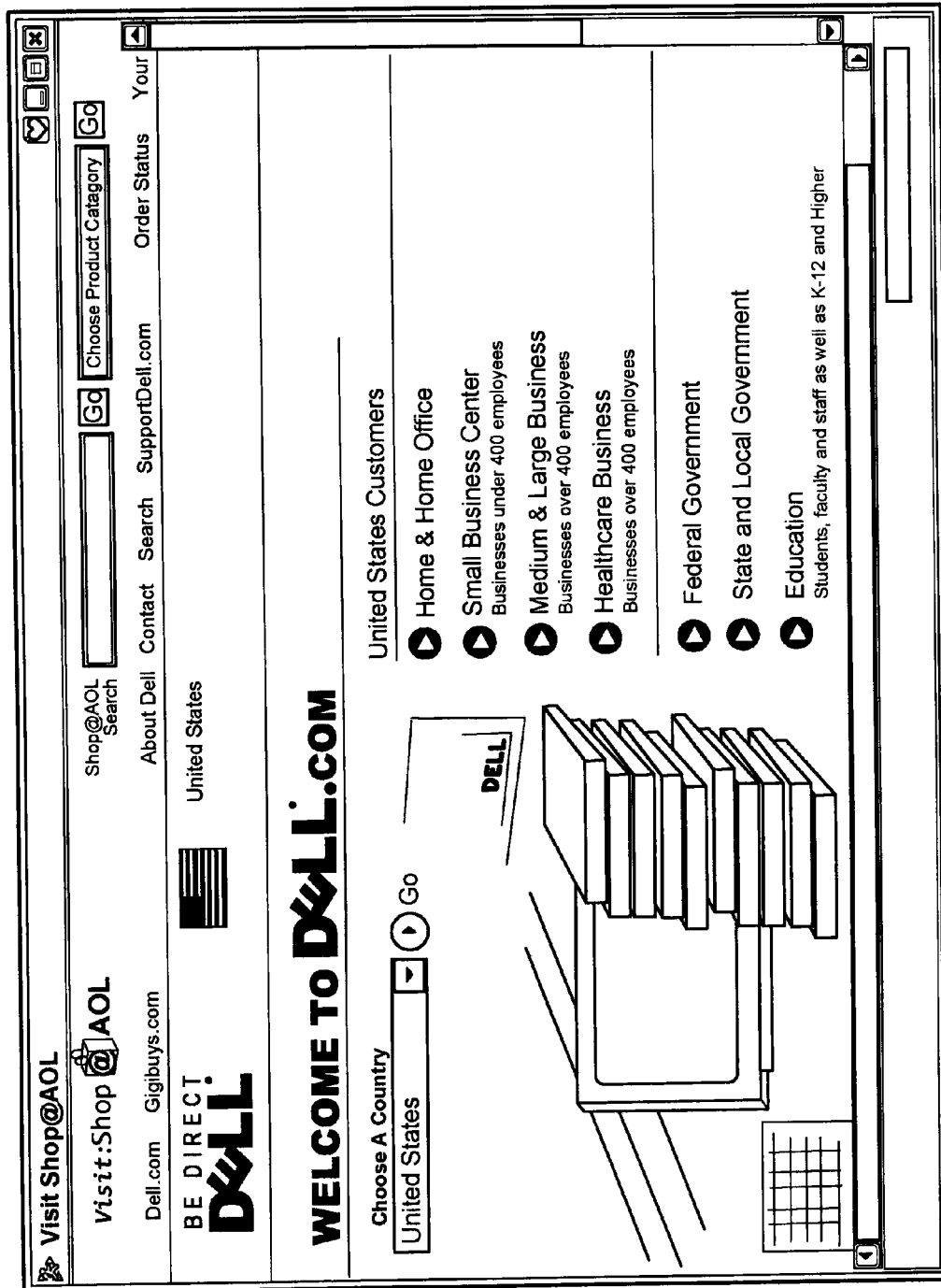
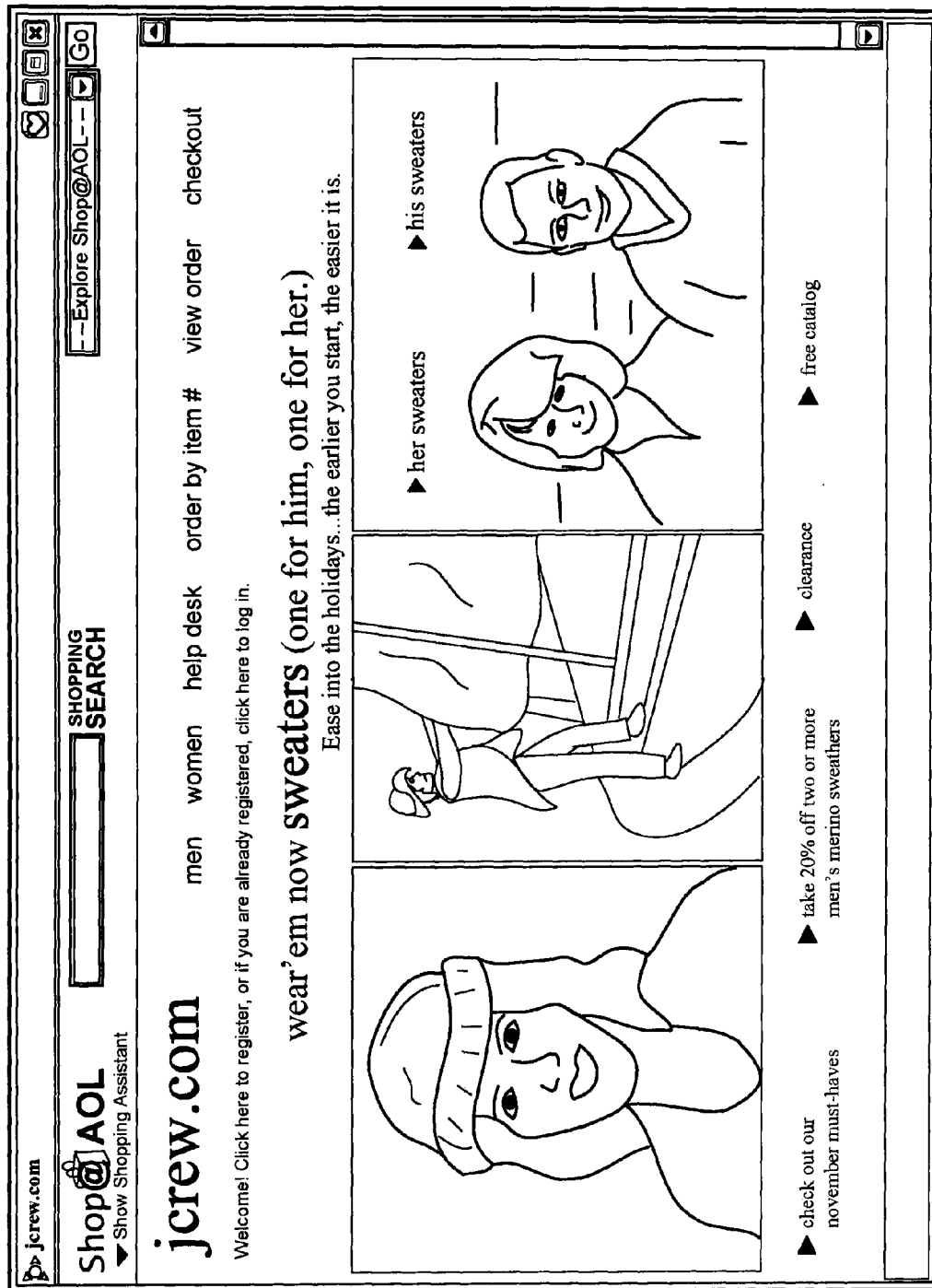


FIG. 4C



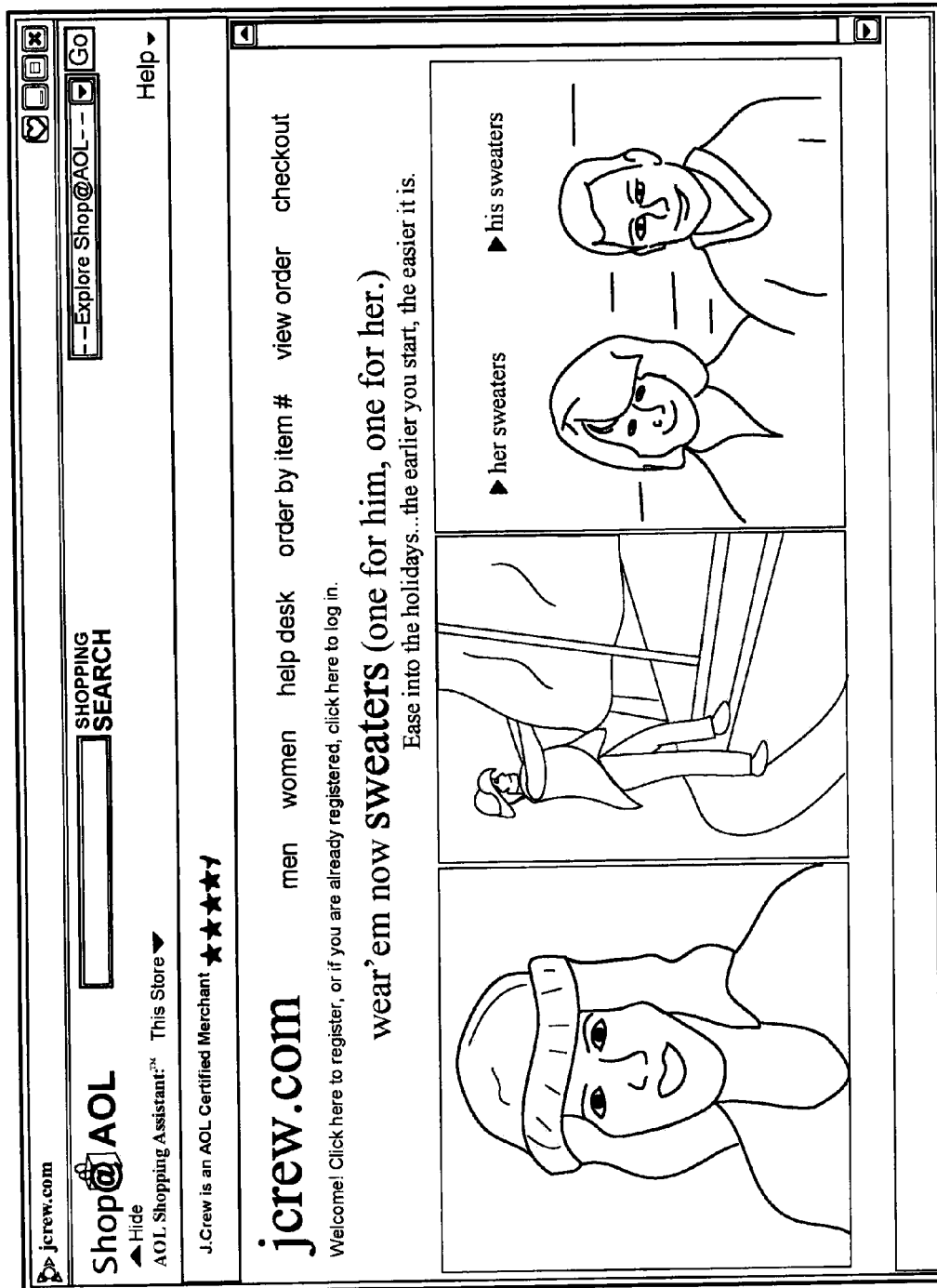


FIG. 4E

PROCESSING SELECTED BROWSER REQUESTS

CROSS-REFERENCE TO RELATED APPLICATIONS

This application is a continuation of U.S. patent application Ser. No. 13/191,844, filed Jul. 27, 2011, titled "Processing Selected Browser Requests", which is a continuation of U.S. patent application Ser. No. 12/172,703, filed Jul. 14, 2008, titled "Processing Selected Browser Requests", now issued as U.S. Pat. No. 7,996,460, which is a continuation of U.S. patent application Ser. No. 09/693,840, filed Oct. 13, 2000, titled "Processing Selected Browser Requests", now issued as U.S. Pat. No. 7,401,115, which claims priority to and the benefit of U.S. Provisional Application No. 60/160,874, filed Oct. 22, 1999, titled "Sharing a User's Personal Information." The contents of each of the aforementioned applications and patents are hereby incorporated by reference in their entirety.

TECHNICAL FIELD

The present invention generally relates to processing selected browser requests.

BACKGROUND

Internet use has become increasingly pervasive in recent years. Resources available on the Internet include electronic content and services. Internet resources may be accessed using a browser and an Internet service provider (ISP). An ISP includes a computer or group of computers that enable a physical connection between the Internet and the computer of a person seeking access to the Internet ("client computer"). A browser is a software tool installed on the client computer and designed to enable communications over the physical connection established by the ISP. In this manner, the browser and ISP may be used together to allow communications between the client computer and other computers that are connected to the Internet.

More specifically, a web browser is a program that enables requests to be made of web servers connected to the Internet using a Hypertext Transfer Protocol (HTTP), an application layer protocol for exchanging files on the World Wide Web (www) that is defined in Internet standard RFC 2068. The browser displays web pages provided in response to these requests. A browser may also be used for displaying documents described using the Hypertext Markup Language (HTML).

A single web page may be composed of several different files potentially of different data types (for example, text, graphics, images, virtual worlds, sounds, and movies). In addition, a web page can include links pointing to other resources available on the network (for example, web pages or individual files). Links can be displayed as text strings, as graphical images, or as combinations of the two. Each link has a network address or uniform resource locator (URL), which is essentially a pointer to network resources that is defined by Internet standard RFC 1738.

When a user clicks on or otherwise selects a displayed link, the browser automatically retrieves the web page (or other resource) corresponding to the link's associated URL and displays or executes that link. A computer operator may also access desired Internet resources using browser requests that typically include a domain name corresponding to one or more destination servers storing desired Internet resources,

e.g., www.jcrew.com or www.dell.com. Browser requests may also include the URL of specific web pages stored on those destination servers, e.g., www.jcrew.com/homepage.html. In either case, a browser request may be satisfied by mapping a specified domain name or URL to a corresponding destination server.

SUMMARY

In one aspect, generally, processing a browser request that specifies a destination network resource generally includes intercepting a browser request that specifies a selected destination network resource and redirecting the browser request to a network server that differs from the destination resource specified by the browser request.

Implementations may include one or more of the following features. For example, the intercepting may include routing the browser request to a proxy server including a list of selected network resources, comparing the browser request to the list of selected network resources, and intercepting the browser request when the browser request includes one or more of the selected network resources that are specified by the list. The redirecting may include comparing the browser request to a list that includes instructions associated with the destination resource and performing the instructions associated with the destination resource. Performing the instructions may include displaying content that differs from the destination resource; adding content to the destination resource and displaying the destination resource that includes the added content; and displaying content from the destination resource from a network server that differs from the destination resource.

In another general aspect, processing a browser request also may include intercepting a browser request received from a client computer at a proxy server when the browser request specifies a selected destination network resource and performing instructions associated with, and in addition to, instructions performed to download the selected destination network resource.

Other features and advantages will be apparent from the description, including the drawings, and from the claims.

DESCRIPTION OF DRAWINGS

FIG. 1A is a block diagram of a system capable of processing filtered browser requests.

FIGS. 1B and 1C illustrate, respectively, a trap list and an instruction list used by the system of FIG. 1A.

FIGS. 2A and 2B are flowcharts showing processes performed to process filtered browser requests.

FIGS. 3A and 3B are block diagrams showing components within a system capable of processing filtered browser requests.

FIGS. 4A-4E are illustrations of views presented to online operators that submit filtered browser requests.

DETAILED DESCRIPTION

It is possible to enhance or replace the content and/or functionality of a desired Internet resource by intercepting selected browser requests and redirecting those browser requests to resources that differ from the desired Internet resource. In one implementation, a proxy server is used to intercept browser requests, compare the intercepted browser requests against selected domain names, redirect browser requests that include selected domain names to a jump server other than the server containing the requested resource, and

process those browser requests to provide content or functionality other than that of the destination resource. In another implementation, rather than using a proxy server, software is provided on a client computer to intercept selected browser requests and redirect those requests to the jump server. In yet another implementation, rather than using a jump server, software is provided on the proxy server for intercepting and processing browser requests to provide content or functionality that differs from the content and functionality provided by the destination resource.

In each of these implementations, the browser request may be redirected to a resource other than the destination resource, e.g., a server other than the destination server or a uniform resource locator (URL) other than the destination URL. The browser request may also be processed such that content is provided in addition to the content of the destination resource. For example, for selected browser requests, the display may be reconfigured to add one or more windows other than the window used to display content from the destination resource. These windows may overlay the window used to display content from the destination resource, or they may be arranged for display in addition to that window (e.g., windows positioned adjacent the window used to display content from the destination resource).

FIG. 1A shows a computer system 100 capable of filtering and processing browser requests. The system 100 includes a client computer 110, a proxy server 120, a network 130, a destination server 140, and a jump server 150.

Client computer 110 is typically implemented in a personal computer (PC), laptop computer, or workstation computer. Client computer 110 includes hardware and software that allows an operator to perform various tasks, such as communicating with other computers and their operators, accessing resources stored on the computer or other accessed computers, and viewing, creating, and manipulating electronic content (e.g., any combination of text, images, movies, music or other sound, animations, 3D virtual worlds, and links to other objects). More specifically, client computer 110 includes various input/output (I/O) devices (e.g., mouse, keyboard, microphone, video input/output, touchscreen input, display and modem). Client computer 110 also generally includes a general or special purpose computer having a central processor unit (CPU), I/O ports and drivers, memory, and storage devices. Examples of memory devices include volatile and/or non-volatile devices such as flash memory, random access memory (RAM), read-only memory (ROM), programmable read-only memory (PROM), erasable PROMs, and electrically erasable PROMs. Examples of storage devices include floppy disk drives, compact disk (CD) drives, digital versatile disk (DVD) drives, permanent (hard) disk drives of magnetic and optical types, and tape or backup drives.

The storage of client computer 110 includes software for accessing an Internet service provider (ISP), which software enables communications with network resources over a modem or other telecommunications devices. The software includes a browser that is used by operators of the client computer 110 to generate requests for network resources accessed by the modem or telecommunications devices. Using browser software, client computer 110 is able to access the electronic content and resources stored locally within its own storage and memory, or the electronic content and resources stored on remote computers, which may represent client computers of other users or destination servers such as that shown by reference numeral 140.

Proxy server 120 is an intermediary that is positioned between client computer 110 and network resources (e.g., destination server 140 and jump server 150). Typically, an IP

address for proxy server 120 is specified as a configuration option for the browser or other protocol program. Once this address is specified, communications between client computer 110 and network 130 are routed through proxy server 120. Proxy server 120 is invisible to the operator of client computer 110, as all network requests and returned responses appear to be directly sent or received from the addressed destination server. An example of a proxy server 120 includes Internet service provider (ISP) computers, where communications between client computer 110 and the Internet are routed through the ISP computers.

Proxy server 120 can be configured to provide security, administrative control, and caching services. Proxy server 120 may be associated with, or be part of a gateway that separates an internal network of client computers 110 from external network 130, and may provide a firewall that protects the internal network from outside intrusion.

Proxy server 120 generally includes a cache of previously downloaded network resources (e.g., web pages). When a browser request from client computer 110 is received by proxy server 120, the proxy server filters each request against the cache of previously downloaded network resources. If a match exists between the browser request and a cached network resource, proxy server 120 is able to generate and return a response to client computer 110 without forwarding the browser request to network 130. Conversely, if the browser request does not match a cached network resource, proxy server 120 uses one of its own IP addresses to request the network resource from destination server 140 over network 130, with proxy server 120 acting as a client on behalf of client computer 110. When the requested network resource is returned to proxy server 120, that network resource is forwarded to client computer 110. In the implementation of FIG. 1A, proxy server 120 includes one or more trap lists 120a that are used for comparison against browser requests received from the browser software on client computer 110.

FIG. 1B provides an example of a trap list 120. This particular trap list 120a shows a list of domain names against which browser requests from client computer 110 are compared and with which browser requests including selected domain names (a "selected browser request") are identified. Trap list 120a also may include other criteria against which browser requests may be compared, such as, for example, uniform resource locators (URLs). Furthermore, as an alternative or complement to trap list(s) 120a, proxy server 120 may include other search and/or filtering criteria or algorithms used to identify selected browser requests. In any event, the proxy server 120 specifies one or more destinations for browser requests discriminated by the trap list 120a or other search and filtering criteria.

Network 130 is positioned between client computer 110 and network resources at destination server 140 and enable electronic communications between them. Typically, network 130 includes an intranet, a local area network (LAN), a wide area network (WAN) such as the Intranet, or some combination of these components.

Destination server 140 is a computer that is electrically coupled with network 130 and stores selected resources (e.g., content and services) and provides client computers 110 access to those selected network resources in response to browser requests. Typically, a destination server 140 is identified by a domain name and is accessed in response to browser requests including that domain name. An example of a destination server 140 is a host computer that provides subscribers with online computer services such as e-mail, e-commerce, chat rooms, Internet access, and electronic newspapers and magazines. Users of services offered by a

5

host computer typically communicate with one or more central servers through client software executing on their respective client computers 110.

Jump server 150 is a computer that is also connected to network 130. In the implementation shown in FIG. 1A, jump server 150 receives browser requests trapped by proxy server 120. Jump server 150 includes an instruction list 150a that associates trapped browser requests with processing instructions that differ from the processing instructions included at the destination server specified in the browser requests.

FIG. 1C provides an example of an instruction list 150a. This particular instruction list 150a specifies a series of domain names and related processing instructions. For example, the domain `http://sportsmansguide.com` is associated with three processing instructions: (1) `{{ADP file}frameset.adp}`—a file with instructions for splitting the display window before displaying content from `sportsmansguide.com`, (2) `{{Real URL} http/www.sportsmansguide.com/?}`—a command for displaying the destination server resource in a first of the split windows, and `{enabled t} {title "Sportsman's Guide"}`—a file for displaying a shopping bar in the second split window with the title "Sportsman's Guide." Other domains within the instruction list are generally associated with processing instructions that differ from the processing instructions specified for the `www.sportsmansguide.com` domain, although they may be the same as those instructions. In this manner, it is possible to use the instruction list to supplement the content of the destination resource.

Typically, proxy server 120, destination server 140, and/or jump server 150 will not be single monolithic entities. Rather, each will include several interconnected server computers to distribute load. Each interconnected server computer may be dedicated to performing independent or duplicative operations, and/or to particular geographic regions or characteristics.

FIG. 2A shows several steps used to process selected browser requests. In FIG. 2A, when an online operator enters a browser request (step 210), the browser request is filtered (step 220). Non-selected browser requests are routed to the destination resources specified by the browser requests (step 230) and selected browser requests are redirected to provide content or functionality other than that of the destination resource (step 240).

More specifically, online operators enter browser requests (step 210) using browser software stored and run by client computer 110. A typical browser request includes the domain name of a destination server upon which a resource is located. For example, a browser request for resources located on the destination server identified as `www.jcrew.com` may include that domain name. Furthermore, if specific resources are requested from particular html pages ("webpages") of the destination resource, the URL corresponding to those webpages may also be included in the browser request. An example of a browser request including a URL for a desired resource is `www.jcrew.com/homepage.html`.

Selected browser requests are then identified for additional processing using filtering techniques (step 220). For instance, in the implementations described with respect to FIGS. 1A and 3A, the browser requests are routed to proxy server 120. At the proxy server 120, the browser requests are compared against a trap list 120a that includes criteria such as domain names and/or URLs of selected resources. However, in other implementations, such as the one shown in FIG. 3B, the browser request may be compared to a trap list located at the client computer. In each of these implementations, other searching and filtering criteria may be used to identify

6

selected browser requests. For example, domain extensions (`.com`, `.gov`, `.edu`) may be used as search/filtering criteria.

When a browser request is not identified for additional processing according to the filtering techniques (step 220), that browser request is routed to the specified destination resource to be processed in accordance with conventional methodologies (step 230). That is, when a browser request is not identified as a selected browser request, the destination server is accessed and the destination resource is downloaded without additional processing.

Conversely, when a browser request is selected for additional processing (step 220), the browser request is redirected to a jump server that is programmed to provide content and/or functionality other than that of the specified destination resource (step 240). For instance, FIG. 2B describes one implementation of step 240, where selected browser requests are re-routed from the destination server specified by the browser request (step 242), appropriate additional processing is identified for the browser requests (step 244), and the identified processing is performed with respect to each browser request (step 246).

More specifically, in step 242, selected browser requests are routed to one or more jump servers that differ from the destination servers specified by the browser requests. The jump servers are generally identified by trap lists or other filtering criteria used to discriminate the selected browser requests. Although the selected browser requests are typically routed to a single jump server or single bank of jump servers, it is also possible to route the selected browser requests to several different jump servers.

In step 244, instruction sets included on the jump server are used to identify processing appropriate for the selected browser requests. For instance, an example instruction list is shown by FIG. 1C and described above. By matching the browser request against the information in an instruction list on the destination jump server specified for the browser request, a set of process instructions appropriate for the selected browser request may be identified.

In step 246, the instructions specified in the instruction list for the selected browser request are performed. Depending upon the instructions provided in the instruction list, it is possible to change the domain name of a destination server to a domain name that enables evaluation of browser activities with respect to goods or services associated with host of the domain server. For instance, if a browser request specifies `www.jcrew.com`, the browser request may be re-routed to `www.jcrew.com/aol`, which domain enables tracking of browser activities with respect to the JCREW website. Alternatively, it is possible to split a window and to display a toolbar or additional content (e.g., advertising) for domain names and URLs specified in selected browser requests.

For instance, as described with respect to the sample instruction provided in the example instruction list provided by FIG. 1C, the domain `http://sportsmansguide.com` is associated with three processing instructions. The first instructions `{{ADP file}frameset.adp}` split the display window before displaying content from `sportsmansguide.com`. The second instructions are commands for displaying the destination server resource in a first of the split windows, and the third instructions are commands for displaying a shopping bar in the second split window.

FIGS. 3A and 3B show components of alternative systems for processing filtered browser requests. The systems of FIGS. 3A and 3B operate similarly to the system 100, with differences noted below.

In the implementation of FIG. 3A, jump server 150 is eliminated for purposes of the described operations, and

instruction list **150a** is included on proxy server **120**, replacing trap list **120a**. With this configuration, browser requests received by proxy server **120** from client computer **110** are compared against instruction list **150a** in a manner similar to the process of comparing received browser requests against trap list **120a** described above in step **220** of FIG. 2A. Browser requests identifying selected network resources are then processed by proxy server **120** according to the processing performed by jump server **150** in the implementation of FIG. 1A, which is described above with respect to step **240** of FIG. 2A and steps **244** and **246** of FIG. 2B.

In the implementation of FIG. 3B, proxy server **120** is eliminated for purposes of the described filtering operations, and trap list **120a** is stored at client computer **110**. As such, browser requests are compared with the trap list **120a** before being sent from client computer **110**, and browser requests identifying selected network resources are re-routed by client computer **110** to jump server **150** for further processing.

The system and process described above find particular utility when applied to facilitate online shopping (also known as electronic commerce, or more familiarly e-commerce). Specifically, using the concepts described above, a toolbar enabling relevant shopping tools may be combined with merchant web pages. For the user, this combination enables one-click access to key tools and support information. By customizing the toolbar appearance, it is possible to use this technology to establish a consistent, universal appearance for users navigating e-commerce web sites.

FIGS. 4A-4E illustrate examples of displays created by splitting windows and enhancing the content of destination servers and resources in the manner described with respect to FIGS. 2A and 2B.

Referring to FIG. 4A, a representative toolbar layout illustrates one embodiment of a proxy-fed toolbar **400** that would appear as a banner in the upper portion of the computer screen as a horizontal strip that extends across the entire computer screen, from left to right.

In a preferred implementation, the proxy-fed toolbar **400** consists of two segments: a "Universal" segment **405**, which corresponds to the upper half of the toolbar, and a "Site" segment **410**, which corresponds to the lower half of the toolbar.

The Universal segment **405** of the proxy-fed toolbar **400** contains several features. First, it displays the brand name of the online service provider, for example, the "Shop@AOL" brand **415**. The brand image links to the main web page of that brand's shopping main page.

The Universal segment **405** of the toolbar **400** also contains a single-selection drop-down menu **420** containing some or all shopping categories, listed in alphabetical order. Exemplary shopping categories include the following: Apparel, Arts and Collectibles, Auctions & Outlets, Auto Center, Computing Center, Consumer Electronics, Entertainment, Food and Gourmet, Gift Center, Health and Beauty, Home and Garden, Home Office & Business, Jewelry & Accessories, Kids, Pet Center, and Sports & Outdoor.

The Universal segment of the toolbar contains a "Go" button **425**. When a user clicks on the "Go" button **425**, a new browser request is entered to again invoke the above described processes.

The Universal segment of the toolbar contains a "Customer Service" link **430**. When a user clicks on the "Customer Service" button **430**, an electronic link to a menu web page is activated. The Customer Service web page provides a user with several options designed to address typical customer concerns.

The Universal segment of the toolbar contains an "AOL Guarantee" link **435**. When a user clicks on the "AOL Guarantee" button **435**, an electronic link to a web page containing a guarantee is displayed that is designed to provide the customer with protection in the event of unfair treatment by a merchant.

The Universal segment of the toolbar contains a "Buying Guides" link **440**. The Buying Guides link **440** is shown as a question mark ("?") on the toolbar. When a user clicks on the Buying Guides link **440**, an electronic link to a web page designed to assist the user with navigating through the web site and to find appropriate merchants for the shopping needs of the user is activated.

In another embodiment, the toolbar contains a "Quick Checkout" link. The Quick Checkout link is designed to accelerate the process of transacting business. Further details on the Quick Checkout link are described in provisional application No. 60/160,874 filed Oct. 22, 1999 and the utility application filed concurrently with this application, which is titled "Sharing the Personal Information of a Network User With Resources Accessed By That Network User." Both of these applications are incorporated by reference in their entirety.

The site segment of the toolbar contains a "Department History" link **445**. When a user clicks on the Department History link, a menu containing the shopping categories (see the shopping category drop-down menu option **420**, described above) appears, and the user can select which shopping category is of interest. After the user selects a category, a display appears showing which merchants within that category have been previously accessed by the user in reverse chronological order. Each item in the display is a hyperlink to the merchant's web site. The Department History link **445** is thus intended to assist the user by recognizing that shoppers often will patronize merchants that they have patronized before.

The Site segment of the toolbar contains a "Back to <Merchant>" link **450**. The Back to Merchant link **450** enables a user to quickly return to the most recently visited merchant site, by clicking on the link.

The Site segment of the toolbar contains a Search interface, including an input box **455** and a "Search" button **460**. The Search input box **455** can accept strings of at least a pre-defined number (e.g., 30) characters. After a user enters a string into the input box **455**, the user then clicks on the Search button **460**, and a keyword search is performed upon the merchant web sites that are accessible via the toolbar. In this manner, a customer can easily search for an item of interest.

FIG. 4B illustrates a window displayed in response to a browser request for www.jcrew.com, where the destination server is displayed on only a portion of the screen. In the FIG. 4B example, the window is split into an upper window and a lower window. While the destination server is accessed and appropriate contents from the destination server are displayed in one of the windows (lower), a toolbar is formed in the upper window to enable improved functionality. The content of the toolbar may vary site-to-site based on various criteria. For instance, the toolbars of FIGS. 4B and 4C differ slightly, FIG. 4B generally corresponding to member or affiliate web sites and FIG. 4C generally corresponding to non-member web sites.

Similarly, FIGS. 4D and 4E are used to illustrate additional content that may be delivered based on the identification of selected destination servers. In FIG. 4D, a toolbar similar to that of FIG. 4B is provided. However, in FIG. 4E, a toolbar is enhanced with a rating for services and content provided by

the domain specified by the browser. This additional content may be immediately apparent during the initial rendering of the display, or it may be added to the display in the form of an update. In this manner, processing may be performed to identify or determine the information to be supplementally displayed without delaying the display expected by the user, and without requiring the display to completely refresh when the supplemental information becomes available.

A number of embodiments of the invention have been described. Nevertheless, it will be understood that various modifications may be made without departing from the spirit and scope of the invention. For example, other toolbars may contain additional features. Accordingly, other embodiments are within the scope of the following claims.

What is claimed is:

1. A method comprising:
 - intercepting a browser request that specifies a selected destination network resource;
 - determining, using at least one processor, whether the browser request necessitates additional processing based on a comparison of the selected destination network resource to a list indicating browser requests that necessitate additional processing;
 - if it is determined that the browser request necessitates additional processing, redirecting the browser request to a network server that differs from the selected destination network resource specified by the browser request; and
 - if it is determined that the browser request does not necessitate additional processing, directing the browser request to the selected destination network resource.
2. The method of claim 1, wherein the intercepting includes:
 - routing the browser request to a proxy server including a list of selected network resources;
 - comparing the browser request to the list of selected network resources; and
 - intercepting the browser request when the browser request includes one or more of the selected network resources that are specified by the list.
3. The method of claim 1, wherein the redirecting includes:
 - comparing the browser request to a list that includes instructions associated with the selected destination network resource; and
 - performing the instructions associated with the selected destination network resource.
4. The method of claim 3, wherein performing the instructions includes displaying content that differs from the selected destination network resource.
5. The method of claim 3, wherein the performing the instructions includes:
 - adding content to the selected destination network resource; and
 - displaying the selected destination network resource that includes the added content.
6. The method of claim 3, wherein the performing the instructions includes displaying contents from the network server that differs from the selected destination network resource.
7. A method of processing a browser request specifying a destination network resource, comprising:
 - receiving a browser request from a client computer, wherein the browser request specifies a selected destination network resource;
 - determining, using at least one processor, whether to intercept the browser request based on a comparison of the

- selected destination network resource specified by the browser request to a list indicating browser requests that require interception; and
- if it is determined that the browser request requires interception:
 - intercepting the browser request received from the client computer at a proxy server; and
 - performing instructions associated with and in addition to instructions performed to download the selected destination network resource.
- 8. The method of claim 7, wherein the intercepting includes:
 - routing the browser request to the proxy server including a list of selected network resources with associated instructions;
 - comparing the browser request to the list of selected network resources; and
 - intercepting the browser request when the browser request includes one or more of the selected network resources that are specified by the list.
- 9. The method of claim 7, wherein the performing instructions includes displaying content that differs from the selected destination network resource.
- 10. The method of claim 7, wherein the performing instructions includes:
 - adding content to the selected destination network resource; and
 - displaying the selected destination network resource that includes the added content.
- 11. The method of claim 7, wherein the performing instructions includes displaying contents from the network server that differs from the selected destination network resource.
- 12. A system comprising:
 - at least one processor; and
 - at least one non-transitory computer readable medium storing instructions thereon that, when executed by the at least one processor, cause the system to:
 - intercept a browser request that specifies a selected destination network resource;
 - determine whether the browser request necessitates additional processing based on a comparison of the selected destination network resource to a list indicating browser requests that necessitate additional processing;
 - if it is determined that the browser request necessitates additional processing, redirect the browser request to a network server that differs from the selected destination network resource specified by the browser request; and
 - if it is determined that the browser request does not necessitate additional processing, direct the browser request to the selected destination network resource.
- 13. The system of claim 12, wherein the instructions, when executed by the at least one processor, further cause the system to:
 - route the browser request to a proxy server including a list of selected network resources;
 - compare the browser request to the list of selected network resources; and
 - intercept the browser request when the browser request includes one or more of the selected network resources that are specified by the list.
- 14. The system of claim 12, wherein, if it is determined that the browser request necessitates additional processing, the instructions, when executed by the at least one processor, further cause the system to:
 - access instructions associated with the selected destination network resource; and

11

perform the instructions associated with the selected destination network resource.

15. The system of claim **14**, wherein, if it is determined that the browser request necessitates additional processing, the instructions, when executed by the at least one processor, further cause the system to:

add content to the selected destination network resource;
and

display the selected destination network resource including the added content.

16. The system of claim **14**, wherein, if it is determined that the browser request necessitates additional processing, the instructions, when executed by the at least one processor, further cause the system to display contents from the network server that differs from the selected destination network resource.

17. The system of claim **14**, wherein, if it is determined that the browser request necessitates additional processing, the instructions, when executed by the at least one processor, further cause the system to display content that differs from the selected destination network resource.

12

18. The system of claim **14**, wherein, if it is determined that the browser request necessitates additional processing, the instructions, when executed by the at least one processor, further cause the system to display at least one of the following:

a toolbar;

advertising; or

a shopping bar.

19. The system of claim **14**, wherein, if it is determined that the browser request necessitates additional processing, the instructions, when executed by the at least one processor, further cause the system to split a window presenting the selected destination network resource.

20. The system of claim **19**, wherein the instructions, when executed by the at least one processor, further cause the system to present content from the network server that differs from the selected destination network resource in a portion of the split window.

* * * * *